

Demonstration of Autonomous Rendezvous Technology (DART)

Case Study Transcript

Jim Lomas

Flight System
Introduction

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The GN&C system consisted of a flight computer, the flight software that is embedded in that computer, and several sensors that fed the algorithms in the flight software: the GPS receiver (there were two, the SIGI and the Surrey); and the AGVS sensor, which was our proximity sensor; and some thruster commanding information that came into the flight software. So all of that information went into the flight software into a Kalman filter which is used to develop a navigation state of the vehicle.

In the algorithms I was just talking about, there's a navigation filter, this is called a Kalman filter. It fuses various sensor information to give you the best sensor locations of the vehicle. There is something called gains that are used to allow that error to be larger or smaller, a lot of vehicles used to fix gains that slowly tighten up as you move along in the mission, some gain algorithms allow those to be opened back up later to let more data come back in if something had happened. In this case on DART we actually used a fix gain schedule that constantly got tighter and tighter as we got closer to the target.